

PORTABLE CUSHION AND METHOD OF USE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of, and claims priority to, pending U.S. Nonprovisional application Ser. No. 15/582,658, filed Apr. 29, 2017, titled “Portable Cushion and Method of Use,” the entire contents of which are hereby incorporated by reference.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH

[0002] Not applicable.

BACKGROUND

[0003] Pressure ulcers continue to plague the lives of paraplegics, quadriplegics, bed-ridden patients, the disabled, et al. Pressure ulcers, also known as pressure sores, bedsores, and decubitus ulcers, are localized injuries to the skin or underlying tissue that usually occur over a bony prominence as a result of pressure, or pressure in combination with shear and/or friction. Approximately one to three million people in the United States will develop pressure ulcers each year, and about sixty thousand people will die from pressure ulcer complications annually.

[0004] Based on current events, it is anticipated that the responsibility for individuals and providers to prevent and cater to pressure ulcers is much greater. One solution is said to exist: relieving skin pressure over a bony prominence for five minutes every two hours, which will allow adequate perfusion and prevent tissue breakdown.

[0005] In one embodiment of the present invention, in order to overcome the problem of pressure sores and to contribute to a solution, a seating system in the form of a deflatable wheelchair cushion, divided into multiple compartments, is being proposed. In some embodiments, the wheelchair cushion contains a sand based top layer and an air pump that deflates one compartment at a time in a rotating motion. Thus, a portion of the user’s buttocks will be continually relieved for fifteen minutes over a two-hour cycle.

[0006] In several embodiments, the present invention is different from the ones on the market in several ways: it is connected to a microcontroller and a network of sensors that react to the areas of high pressure by inflating and deflating areas of the cushion, rotates air constantly throughout the chair, and is connected to a communication device to provide optional user feedback. The products on the market do not provide those features.

[0007] In several embodiments of the present invention, the present invention is an inflatable cushion, for use in multiple applications, comprising; a cover; a base; a communication device; a microcontroller; a power source; a gas pump; a primary tube; a blow off valve; two-way valves; a plurality of secondary tubes; and a plurality of bladder pods with pressure sensors.

[0008] One prior art piece Habegger—US 2009/0265857 operates with individual pressure compartments that are not connected. Habegger also utilizes a foam cylinder, spring elements, and multiple inflatable layers; all of which are not found in the present invention. In several embodiments, the

present invention is connected to a microcontroller, has a network of sensors, inflates in response to data from sensors, and has two-way valves.

[0009] Another piece of prior art, Weston U.S. Pat. No. 8,545,464, operates as a wound treatment apparatus. Weston utilizes a “cover with protrusions on its surface for purposes of monitoring pressure”; this is not found in the present invention. In several embodiments, the present invention is designed to prevent the development of pressure ulcers.

[0010] A third piece of prior art, Myers et al. U.S. Pat. No. 8,312,569, functions as an apparel garment with a padded portion. The invention of Myers is not a cushion, and there are no compartments, unlike the present invention.

[0011] One other piece of prior art is Weston U.S. Pat. No. 8,602,271, (“Weston II”) which is designed for patients with wounds and for the purpose of treating existing wounds. Weston II contains a fluid impermeable membrane, a “cover with protrusions on its surface,” an absorbable matrix,” and a feature to monitor temperature: all of which is not found in the present invention. In many embodiments, the present invention has air compression and air bladders, unlike Weston II. In many embodiments, the present invention is connected to a microcontroller, unlike Weston II.

[0012] Kamen et al.—U.S. Pat. No. 6,092,249, utilizes hollow foam members that does not have the constant air circulation of several embodiments of the present invention.

[0013] Augustine et al., U.S. Pat. No. 6,033,432, is different from the present invention because it is solely for selectively cooling weight-bearing areas of the body in order to prevent or reduce damage. Taylor et al., U.S. Pat. No. 6,014,784, operates on a “timing” system, unlike several embodiments of the present invention. In several embodiments of the present invention, the present invention employs a plurality of sensors that provide feedback to a microcontroller, which then determines the inflation patterns. Wilkerson, U.S. Pat. No. 5,839,140, uses fluid-fillable cells rising from the base member. Wilkerson has a layer of cells that contain liquids in them. In several embodiments, the present invention is filled with air and uses an air compressor. The present invention has bladders that, without air or a gas, would be empty. The present invention, in several embodiments, has a top layer of padding above the plurality of bladders. DeBellis et al., U.S. Pat. No. 5,857,749, is not compartmentalized and maintains a uniformed pressure throughout the whole cushion. The present invention is compartmentalized and does not maintain a uniform pressure throughout the whole cushion.

[0014] Pearce U.S. Pat. No. 5,829,081 is not filled with air and it does not adjust, unlike the present inventive device. Augustine et al., U.S. Pat. No. 5,800,480, is a mattress. Hand et al., U.S. Pat. No. 5,606,754, utilizes a predetermined pressure all around and is a mattress for a hospital bed, not a wheelchair cushion. Iskra, Jr. et al., U.S. Pat. No. 5,487,197, has “adjoining separate chambers” and maintains an “inflation pressure in the air cushion with an upper and a lower set point.” In several embodiments, the present invention does not have adjoining chambers nor does it regulate the inflation pressure between a set upper and lower point. In several embodiments, the present invention uses feedback from sensors to inflate in response to the data gathered. Graebe, Jr. U.S. Pat. No. 5,473,313, is a pump to work with a cushion. Jay, U.S. Pat. No. 5,457,833, is a pad filled with liquid, not air, unlike the present invention, and it arranges around the grooves of the body. In several embodiments, the